[1145] A number of embodiments have been described. Nevertheless, it will be understood that various modifications may be made. Accordingly, other embodiments are within the scope of the following claims.

[1146] While the principles of the invention have been described herein, it is to be understood by those skilled in the art that this description is made only by way of example and not as a limitation as to the scope of the invention. Other embodiments are contemplated within the scope of the present invention in addition to the exemplary embodiments shown and described herein. Modifications and substitutions by one of ordinary skill in the art are considered to be within the scope of the present invention.

1-25. (canceled)

26. A wearable infusion pump assembly comprising:

a reservoir;

a controller; and

a fluid delivery system having a fluid path to deliver an infusible fluid from the reservoir to a fluid delivery system outlet, the fluid delivery system comprising:

a pump assembly for extracting a quantity of the infusible fluid from the reservoir and providing the quantity of the infusible fluid to the fluid delivery system outlet, the pump assembly having a displaceable member which is displaced as the infusible fluid is transferred with actuations of the pump assembly;

a first sensor assembly including a light emitter and a sensor, to optically sense movement of the displaceable member which is displaced as the infusible fluid is transferred with actuations of the pump assembly;

a first valve assembly selectively isolating the pump assembly from the reservoir;

a second valve assembly selectively isolating the pump assembly from the fluid delivery system outlet; and

a second sensor assembly, including a light emitter and a sensor, to optically sense the movement of the second valve assembly.

27. The wearable infusion pump assembly of claim **26** further comprising a volume sensor assembly, wherein the quantity of the infusible fluid is provided to the volume sensor assembly, and wherein the volume sensor assembly is configured to determine a volume of at least a portion of the quantity of the infusible fluid.

28. The wearable infusion pump assembly of claim **27** wherein the volume sensor assembly is in the fluid path between the second valve assembly and the fluid delivery system outlet.

29. The wearable infusion pump assembly of claim **26** wherein the controller is configured to determine when the reservoir is empty based at least in part upon an output of the first sensor assembly.

30. The wearable infusion pump assembly of claim **28** wherein the controller is configured to determine when the reservoir is empty based at least in part upon an output of the first sensor assembly.

31. The wearable infusion pump assembly of claim **27** further comprising:

a computer readable medium coupled to the controller, the computer readable medium including a plurality of instructions stored thereon which, when executed by the controller, cause the controller to perform operations comprising:

activating the first valve assembly to isolate the pump assembly from the reservoir; and

activating the pump assembly to provide the quantity of the infusible fluid to the volume sensor assembly.

32. The wearable infusion pump assembly of claim **31** wherein the fluid delivery system includes an actuator associated with the first valve assembly and activating the first valve assembly includes energizing the actuator.

33. The wearable infusion pump assembly of claim **32** wherein the actuator includes a shape memory actuator.

34. The wearable infusion pump assembly of claim **31** wherein the fluid delivery system includes an actuator associated with the pump assembly and activating the pump assembly includes energizing the actuator.

35. The wearable infusion pump assembly of claim **34** wherein the fluid delivery system includes a bell crank assembly for mechanically coupling the pump assembly to the actuator.

36. The wearable infusion pump assembly of claim **34** wherein the actuator includes a shape memory actuator.

37. The wearable infusion pump assembly of claim **31** wherein the computer readable medium further includes instructions for:

activating a volume sensor assembly to determine the volume of at least a portion of the quantity of the infusible fluid provided to the volume sensor assembly from the pump assembly; and

activating the second valve assembly to fluidly couple the volume sensor assembly to the fluid delivery system outlet.

38. The wearable infusion pump assembly of claim **37** wherein the fluid delivery system includes an actuator associated with the second valve assembly and activating the second valve assembly includes energizing the actuator.

39. The wearable infusion pump assembly of claim **38** wherein the fluid delivery system includes a bell crank assembly for mechanically coupling the second valve assembly to the actuator.

40. The wearable infusion pump assembly of claim **38** wherein the actuator includes a shape memory actuator.

41. The wearable infusion pump assembly of claim **37** wherein the fluid delivery system further includes:

a bracket assembly configured to maintain the second valve assembly in an activated state; and

wherein the computer readable medium further includes instructions for:

activating the bracket assembly to release the second valve assembly from the activated state.

42. The wearable infusion pump assembly of claim **41** wherein activating the bracket assembly includes energizing a bracket actuator associated with the bracket assembly.

43. The wearable infusion pump assembly of claim **43** wherein the bracket actuator includes a shape memory actuator.

44. The wearable infusion pump assembly of claim **29** wherein the fluid delivery system further includes:

a bracket assembly configured to maintain the second valve assembly in an activated state.

45. The wearable infusion pump assembly of claim **44** wherein activating the bracket assembly includes energizing a bracket actuator associated with the bracket assembly.